

**DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION**

1E14 Revision 5 Lycoming Engines TVO-540-A1A TIVO-540-A2A December 17, 2003
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TYPE CERTIFICATE DATA SHEET NO. 1E14

Engines of models described herein conforming with this data sheet (which is a part of type certificate No. 1E14) and other approved data on file with the Federal Aviation Administration, meet the minimum standards for use in certificated aircraft in accordance with pertinent aircraft data sheets and applicable portions of the Civil Air Regulations/Federal Aviation Regulations provided they are installed, operated and maintained as prescribed by the approved manufacturer's manuals and other approved instructions.

Type Certificate Holder	Lycoming Engines An Operating Division of AVCO Corporation Williamsport, Pennsylvania 17701
Type Certificate Holder Record	Textron Lycoming, AVCO Corporation transferred TC E14EA to Lycoming Engines, An Operating Division of AVCO Corporation on December 17, 2003

	<u>TVO-540-A1A</u>	<u>TIVO-540-A2A</u>
Model Type	Lycoming 6HOA Vertical-Mounted Direct Drive Turbosupercharged	
Rating (See NOTE 5)		
Maximum continuous, hp., r.p.m.	305-3200	315 @ 3200
Takeoff, hp., r.p.m.	305-3200	315 @ 3200
Fuel (Minimum grade aviation gasoline)	100/130	--
Lubricating oil (Lubricants should conform to the specifications as listed or to subsequent revisions thereto.)	MIL-L-6082 or Lycoming Spec. No.301-E	--
Bore and stroke, in.	5.125 x 4.375	--
Displacement, cu. in.	541.5	--
Compression ratio	7.3:1	--
Weight (dry), lb.	499	507
C.G. location (dry and in horizontal position)		
From front face of crankcase, in.	16.00	--
Off crankshaft C.L., in.	1.53 below & 0.60 left	--
Propeller shaft	Flangs type power takeoff	--
Crankshaft dampers and balancers	None	--
Carburetion	Marvel-Schebler MA-6AA	--
Fuel injection	--	Bendix RS-5BD2
Turbosupercharger	AiResearch model T-1112	--
Ignition, dual	Scintilla S6RN-200 & S6LN-204	--
Timing, °BTC	25	--
Spark plugs	see NOTE 4	--
Oil sump capacity	Dry sump	--

NOTES 1, 2, 3, 4, 5, 6 1, 2, 3, 4, 5, 6
“-” indicates “same as preceding model” “—” indicates “not applicable”

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Certification basis

<u>Regulations & Amendments</u>	<u>Model</u>	<u>Date of Application</u>	<u>Date Type Certificate No. 1E14 Issued or Amended</u>
CAR 13 effective June 15, 1956			
As amended by 13-1, 13-2, 13-3	TVO-540-A1A	March 17, 1961	October 18, 1961
13-4	TIVO-540-A2A	March 5, 1963	August 16, 1963

Production basis: Production Certificate No. 3

NOTE 1. Maximum permissible temperatures:

	<u>TVO-540-A1A</u>	<u>TIVO-540-A2A</u>
Cylinder head (well type thermocouple)	500°F	500°F
Cylinder base	300°F	305°F
Oil inlet	235°F	235°F
Carburetor inlet air	345°F	—
Fuel injector inlet air	—	320°F
Exhaust gas	1650°F	1650°F
(Turbo inlet shown on Lycoming Drawing No. ____)	(63156)	(63203)
Compressor temperature rise, maximum	340°F	240°F

NOTE 2. Fuel, oil and air pressure limits:

	<u>Max.</u>	<u>Min.</u>	<u>Idle</u>
Fuel pressure limits p.s.i. (Above carburetor or fuel injector inlet air pressure.)			
TIVO-540-A2A (at inlet to injector)	45	29	—
TWO-540-A1A (at inlet to carburetor)	8	4	
Oil pressure limits p.s.i.	70	50	25
Carburetor inlet air pressure in. Hg. (TWO-540-A1A)	39.5	—	—
Fuel injector inlet air pressure in. Hg. (TIVO-540-A2A)	40.0		
Manifold pressure in. Hg. (TVO-540-A1A)	34.5		
Manifold pressure in. Hg. (TIVO-540-A2A)	36.0		

NOTE 3. The following accessory provisions are incorporated:

<u>Accessory</u>	<u>Rotation Facing Drive Pad</u>	<u>Speed Ratio To Crankshaft</u>	<u>Maximum Torque (in. - lb.)</u>		<u>Max. Overhand Moment (in. - lb.)</u>
			<u>Continuous</u>	<u>Static</u>	
Starter	C	1.000:1	-	12,000	300
Starter (opt.)					
Generator*	C	2.600:1	500	2,200	400
Generator (opt.)					
Fuel pump	CC	.803:1	25	450	25
Vacuum Pump	C	1.219:1	200	800	25
Hydraulic Pump	C	1.083:1	400	1,650	75
Tachometer	CC	.500:1	7	50	-

“C” = Clockwise, “CC” = Counter-clockwise

*Not available as generator drive when fitted with hand crank starter jaw.

NOTE 4. This engine is approved for helicopter application and operation in a vertical mount installation.

NOTE 5. This engine is equipped with an AiResearch Model T-1112 turbosupercharger and integral automatic power control which makes standard dry, sea level ratings available at other than standard conditions up to critical altitudes. Performance data for this engine are presented on Lycoming Curve Nos. (12821 - TVO-540) & (12930-A - TIVO-540).

The turbocharger control is servo-operated from either engine oil or an external supply of MIL-H-5606 hydraulic fluid at a pressure of 60-70 p.s.i. This control is not equipped to use "Skydrol" fluid.

The turbocharger meets the containment requirements of CAR 13.116 and does not require external protection.

NOTE 6. The following spark plugs are approved as shown:

	<u>TVO-540</u>	<u>TIVO-540</u>
AC	SR83P, HSR83P, SR87, HSR87	HSR86L, HSR87LI, HSR87LP, 171, 181 271, 281, 281IR, 273, 283, 293
Auto Lite	SH26, SH260, PH26, PH260	PL300, PL350
BC	485S, RB955S	RB39R
Champion	REM-38E, RHM-38E REM-38P, RHM-38P	REB36W, RHB36P, RHB36W, REB37N RHB37E, RHB37N, 32P, 32W, 32E
Lodge	-	RS35-3R, RS35-4R

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